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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,598	01/16/2004	Ryuji Nishikawa	606402016100	5396

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MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 400
MCLEAN, VA 22102

EXAMINER	
LIN, JAMES	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/758,598	NISHIKAWA ET AL.	
	Examiner	Art Unit	
	Jimmy Lin	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/26/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/21/2008 has been entered.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama (U.S. Patent No. 6,590,335) in view of Yamagata et al. (U.S. Publication No. 2002/0142697) and Matsuura et al. (U.S. Publication No. 2002/0063844).

Nagayama discloses a method of repairing an electroluminescent (EL) display with the irradiation of a laser. The EL display comprises an EL layer formed between an anode and a cathode (Fig. 1). A particle 20 on the EL display causes a defect and a short circuit. The defect is detected by means of visual inspection using a microscope or the like, and then laser irradiation is performed (col. 5, lines 30-67). The laser removes part of the electrode layer 104 around the particle (Fig. 2C-2D).

Nagayama does not explicitly teach forming a high resistivity region as a result of a melting of the EL layer by the laser beam. However, Yamagata discloses a method of repairing defects in an EL layer (abstract; [0004]-[0005]), wherein the repair comprises of turning the defect EL portion into an insulator with a laser [0058]. Yamagata teaches that a method of oxidation or complete removal of defect can turn the defect portion into an insulator and suggests that the process of oxidation is a method of a lesser degree of the process of complete removal, since the oxidation method is merely performed with the laser at a lower power [0059]. Thus, the oxidation method is essentially a process of melting. Yamagata teaches that such a method

of repair is operably equivalent to turning the cathode or anode into an insulator (i.e., the repair method of Nagayama) [0059]. The teachings of Yamagata would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one for the other in a process of repairing an EL layer. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used a laser to melt the EL layer as taught in Yamagata in the process of repairing the EL defect of Nagayama with a reasonable expectation of success.

Yamagata does not explicitly teach that the hole transport layer, emissive layer, and electron transport layer are melted together so that the layered structure disappears and the high resistivity region comprising constituents of the hole transport layer, the emissive layer, and the electron transport layer is formed between the anode and cathode layer. However, Yamagata does teach that the EL layer can comprise of a hole transport layer, an emissive layer, and an electron transport layer [0099]. The repair method is carried out such that the short circuit locations between the cathode and the anode are made into insulators by the irradiation of the laser [0058]. The EL layer comprising the individual layers are all located between the cathode and the anode. The laser irradiation would have been performed on all the layers between the cathode and the anode. Thus, the repair method of Yamagata would have necessarily caused the hole transport layer, emissive layer, and electron transport layer to be melted together.

Nagayama and Yamagata do not explicitly teach that the laser beam is not directly incident on the detected foreign substance. However, Yamagata does teach that the laser repair method can be done by oxidation [0059] while Matsuura teaches that it was well known to use a laser to irradiate around a portion of the substrate in order to isolate that portion. The laser isolates the portion from the remainder of the substrate without the laser being directly incident on the portion ([0026]; Figs. 1 and 4). Because Matsuura teaches that such a method of isolation was operable in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to have irradiated the portions around the defect in order to have oxidized the defect of Nagayama without the laser beam being directly incident on the defect with a reasonable expectation of success. The selection of something based on its known suitability for its

intended use has been held to support a prima facie case of obviousness. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945).

Claim 2: Nagayama and Yamagata do not explicitly teach that the laser beam irradiation is repeated a plurality of times. However, one of ordinary skill in the art would have expected similar results using multiple steps of laser beam irradiation to repair the EL element defect as compared to only using one laser beam irradiation step. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have irradiated the EL element defect a plurality of times in order to repair the EL element with a reasonable expectation of success and with predictably results.

Claims 3-4: Yamagata teaches that the wavelength of the laser beam can range from 375 to 900 nm. Overlapping ranges are prima facie evidence of obviousness (see MPEP 2144.05.I.). It would have been obvious to one having ordinary skill in the art to have selected the portion of Yamagata's wavelength range that corresponds to the claimed range.

Claims 5-6: Yamagata does not explicitly teach that the irradiated region of the display panel is away from the defect by a distance of 5 μm to 10 μm. However, Yamagata does teach that the beam size of the laser can be larger than that of the defect portion [0061]. One of ordinary skill in the art would have recognized that any beam size larger than the size of the defect would have been operable. Yamagata exemplifies a beam size of 1 μm to 3 μm. Because the exemplified range would necessarily be larger than the size of the defect, a beam size larger than 3 μm would necessarily be larger than the defect. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used any beam size larger than the size of defect, including a beam size within range of 5 μm to 10 μm, with a reasonable expectation of success and with predictable results because Yamagata reasonably suggests that the beam size of the laser can be larger than the defect.

Claim 7: Nagayama, Yamagata, and Matsuura do not explicitly teach that the high resistivity region is in contact with an entire lateral edge of the foreign substance. However, Yamagata reasonably suggests that the laser can be applied directly at the defect, and Matsuura reasonably suggests that the laser can be applied at the periphery portions of the defect. One of ordinary skill in the art would have readily recognized that either option would have been operable and that the combined use of both methods would have produced predictable results.

Additionally, "[a] range can be disclosed in multiple prior art references instead of a single prior art reference" and "[t]he court further stated that the 'range' disclosed in multiple prior art patents is 'a distinction without difference'" (MPEP 2144.05.I.). Therefore, the application of the laser both at and around the defect portion would have been an obvious modification to one of ordinary skill in the art such that the laser forms a high resistivity region in contact with an entire lateral edge of the foreign substance.

4. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagayama '335 in view of Yamagata '697 and Matsuura '844 as applied to claims 1-2 above, and further in view of Kodama (JP 2000-195677).

Nagayama, Yamagata, and Matsuura are discussed above, but do not explicitly teach that the irradiated region of the display panel is 5 μm to 10 μm away from the foreign object. However, Kodama teaches a method of detecting and repairing a defect in an EL display via a laser irradiation method [0081]. The luminescence around the repaired portion will slowly degrade and diminish such that the entire pixel may become non-luminescent with time [0081]-[0082]. Thus, the irradiated region can be beyond the immediate area of the foreign substance as long as the irradiated region is within a single pixel, since the entire pixel will eventually become non-luminescent anyway. It would have been obvious to one of ordinary skill in the art at the time of invention to have irradiated any portion of the EL element around the foreign substance within a single pixel, including the claimed distance away from the foreign substance, with a reasonable expectation of success in order to have further prevented a short-circuit.

Response to Arguments

5. Applicant's arguments filed 11/21/2008 have been fully considered but they are not persuasive.

Applicant states on pg. 4 that some minuscule amount of melting might occur when Yamagata's light emitting element 206 is oxidized and argues on pg. 5 that Yamagata's oxidation does not amount to the claimed melting where the hole transport layer, the emissive layer, and the electron transport layer are melted together so that their layer structure disappears. However, the oxidation of Yamagata actually seems to suggest the melting of the light emitting

element. Yamagata teaches that the laser irradiation can be used to cause oxidation or complete removal of the film. The power of the laser can be adjusted to use either method [0059]. The power of the laser essentially affects the rate at which the light emitting element heats up. Excessive heat absorbed in the light emitting element would cause vaporization of the element. This method is analogous to the melting and evaporation of ice. When heat is applied to ice, it melts. When the heat is applied to the melted ice, it evaporates. The melting of the ice is a process of a lesser degree to that of the evaporation of the ice. Additionally, Ozaki '235 teaches that adjusting the power of a laser can cause either melting or vaporization [0026]. Thus, the oxidization of Yamagata is equivalent to melting of the light emitting element.

Applicant argues on pg. 6 that under *KSR*, the Examiner must explain why and how persons of ordinary skill in the art would have used Yamagata's teaching of direct laser irradiation at a defective portion in a pixel of an EL device and Matsuura's teaching of cutting between a TFT switch and a pixel in an LCD device so as to produce the claimed method that includes an indirect laser irradiation of a defective portion but still within a pixel of an EL device. However, Nakamura, Yamagata, and Matsuura are all related to using a laser to electrically isolate a portion of the substrate. One of ordinary skill in the art recognized that the isolation methods of 1) Nakamura and/or Yamagata and 2) Matsuura were operable methods of electrically isolating a portion of the substrate and that substitution of one method with the other would have achieved predictable results. The substitution of equivalents requires no express suggestion (MPEP 2144.06.II.). Additionally, Matsuura's teaches that an indirect laser irradiation is capable of electrical isolation (i.e., similar to the results of Nakamura and Yamagata). The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness (MPEP 2144.07). Therefore, the use of the laser irradiation method of Matsuura in the method of isolating the EL defects of Nakamura and Yamagata would have been obvious to one of ordinary skill.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Asai (JP 2003-178871) teaches a method of repairing a defective portion of an

organic EL layer (abstract; [0008]). Ozaki et al. (U.S. Publication No. 2005/0078235) teaches that a laser can be used in a repair method by a process of melting or vaporizing [0026].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jimmy Lin/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792